REMARKS

The Office Action of January 20, 2004, has been received and reviewed. Claims 15-25 and 31-51 are pending in the application, and all pending claims stand rejected. Claims 15, 21-24, 32, 33, 35-40, 50 and 51 have been amended, claims 16-17, 19-20, 31, 34 and 41-49 have been canceled, and new claims 52-57 have been added as set forth herein. All amendments and cancellations are made without prejudice or disclaimer. Reconsideration is requested.

Priority

A certified copy of EP 98202467.1 is submitted herewith. Applicants have requested a certified copy of EP 98202456.5 and will forward it to the Office as soon as it is received.

Specification

The specification was objected to. Submitted herewith is a substitute specification, excluding claims, incorporating the previous amendments to the specification. No new matter has been added. Withdrawal of the objection is requested.

Oath/Declaration

Applicants' representatives have requested another oath/declaration as requested by the Office and will forward it to the Office as soon as it is received.

Information Disclosure Statement

A new information disclosure statement listing EP 0 750 043 A1 in accordance with the suggestion of the Examiner is included herewith. Pursuant to 37 C.F.R. § 1.98 (3)(i) or (ii), the applicant is providing an English translation of the Abstract of EP 0 750 043 A1 in order to provide the concise explanation of the relevance of the document.

Rejections under 35 U.S.C. § 112, first paragraph

Written Description

Claims 15-25 and 31-51 stand rejected under 35 U.S.C. § 112, first paragraph, as assertedly failing to comply with the written description requirement. Claims 16-17, 19-20, 34

and 41-49 have been canceled rendering the rejections thereof moot. At least partially in view of the amendments to the claims, applicants respectfully traverse the rejections.

Specifically, it was thought that the specification does not place any structural, chemical or functional limitations on the variants of a capsular gene cluster or any structure on the cluster per se. (*See*, Office Action, page 5). Although applicants do not agree that any of the claims lack compliance with the written description requirement, claim 15 has been amended to recite in part a recombinant *Streptococcus suis* mutant deficient in capsular expression and claim 18 has been amended to recite in part a vaccine comprising a *Streptococcus suis* mutant deficient in capsular expression, wherein the *Streptococcus suis* mutant is stable.

Since the as-filed specification discloses that deficient capsular expression may be caused by homologous recombination or cross-over integration events in *Streptococcus suis*, the deficiency in capsular expression is a common structure or function of the *Streptococcus suis* mutant. (*See*, Specification as-filed page 14, lines 25-35). Thus, the specification describes distinguishing and identifying characteristics sufficient to show that the applicants were in possession of the claimed invention at the time the application was filed in accordance with the written description requirement. (*See*, M.P.E.P. § 2163).

Reconsideration and withdrawal of the written description rejections of claims 15, 18, 21-25, 32, 33, 35-40 and 50-51 are requested.

Enablement

Claims 15-25 and 31-51 stand rejected under 35 U.S.C. § 112, first paragraph, as assertedly failing to comply with the enablement requirement. Claims 16-17, 19-20, 34 and 41-49 have been canceled rendering the rejections thereof moot. Applicants respectfully traverse the rejections as set forth herein.

It was thought that the specification was limited to descriptions of part of the capsular gene cluster for serotypes 2, 1, 9 and 7 of *Streptococcus suis*, to specific substitutions of the cps2B and cps2E/F genes, and was not enabled for using the mutant or recombinant microorganism as a vaccine. (*See*, Office Action at page 7). The Office Action further quoted The Dictionary of Immunology to define a vaccine as "'A prophylactic or therapeutic material containing antigens derived from one or more pathogenic organisms which, on administration to

a man or animal, will stimulate active immunity and protect against infection with these or related organism (i.e. produce protective immunity)'" in concluding that the present invention is not enabled as a vaccine. (*Id.*).

"As long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claims, then the enablement requirement of 35 U.S.C. 112 is satisfied." (M.P.E.P. *citing In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA)). Since the specification discloses working examples of a *Streptococcus suis* mutant deficient in capsular expression, one of ordinary skill in the art would be able to make and use the recombinant *Streptococcus suis* mutant of claim 15 or the vaccine comprising a *Streptococcus suis* mutant of claim 18 without undue experimentation. For instance, the specification discloses mutant strains 10cpsB and 10cpsEF as *Streptococcus suis* mutants deficient in capsular expression. (*See*, Specification at page 15, lines 3-6).

The deficiencies in capsular expression are shown in the specification by the *Streptococcus suis* mutants that circumvent difficulties relating to a lack of heterologous protection in a subject since the *Streptococcus suis* mutants do not rely on capsular antigens to induce protection, e.g., the *Streptococcus suis* mutants do not have immunity induced against the capsular antigens since the capsular antigens are not present. (*See generally*, *Id.* at page 16, lines 17-25). Thus, the ability of the *Streptococcus suis* mutants to induce a persistent, but avirulent infection that lasts at least 4-5 days or even up to 5-10 days, and are able to induce a long-lasting immune response demonstrates the deficiency in capsular expression. (*See*, *Id.* at page 16, lines 12-17).

The persistent, avirulent infection of the two mutant strains deficient in capsular expression is further exemplified in the as-filed specification on the experiments in germ free pigs. (*See*, *e.g.*, *Id.* at Table 6). These mutants were able to infect the pigs and disseminate through the body to tissues such as the peritoneal surface, the central nervous system and the joints, yet the clinical symptoms were mild. (*See*, *Id.* at page 39, line 16 through page 40, line 15). Additionally, the specification discloses that phagocytosis of the *Streptococcus suis* mutants deficient in capsular expression by macrophages was increased in relation to the virulent wild

type strain. (*See, Id.* at page 39, lines 1 through 15). Thus, the specification discloses working examples of *Streptococcus suis* mutants deficient in capsular expression.

With regard to the claims directed to a vaccine including the *Streptococcus suis* mutants deficient in capsular expression, applicants submit that the vaccine definition provided by the Office is unduly restrictive, and that the description of the vaccine in the as-filed specification is more in line with the definition of a vaccine in Merriam-Webster's On-Line Dictionary reciting "a preparation of killed microorganisms, living attenuated organisms, or living fully virulent organisms that is administered to produce or artificially increase immunity to a particular disease." (Merriam-Webster's On-line Dictionary, attached hereto in Supplemental IDS). Further, as stated in the as-filed specification "a vaccine according to the invention can include a vaccine in a killed or live form. For example, a killed vaccine including a strain having (over) expressed a Streptococcal or heterologous antigen or virulence factor is very well suited for eliciting an immune response ... the invention provides a vaccine wherein the strain is live, due to its persistent but avirulent character, a *Streptococcus* vaccine as provided by the invention, is well suited to generate specific and long-lasting immune responses." (Specification at page 18, line 8 through page 18, line 17). Thus, one of ordinary skill in the art would be able to make and use the vaccine as defined in the specification of the pending claims without undue experimentation.

To show enablement, the "applicant should be encouraged to provide any evidence to demonstrate that the disclosure enables the claimed invention." (M.P.E.P. § 2164.05). Accordingly, attached hereto in conjunction with the Supplemental IDS is an article demonstrating that one of ordinary skill in the art would be able to make and use the vaccine of the present claims without undue experimentation. For instance, the as-filed specification discloses a vaccine/challenge experiment wherein pigs were vaccinated with a vaccine including the *Streptococcus suis* mutant deficient in capsular expression commensurate in scope with the pending claims. (*See*, Specification at page 28, lines 8-14 and page 39, line 16 through page 40, line 15). The attached article provides evidence that the vaccine induced the production of antibodies and conferred protection against subsequent challenge with a virulent wild type strain of *Streptococcus suis*. (*See*, Wisselink et al., Veterinary Microbiology 84 (2002), pages 160-

163). Accordingly, one of skill in the art would be able to make and use the vaccine of the pending claims without undue experimentation.

Reconsideration and withdrawal of the enablement rejections of claims 15, 18, 21-25, 32, 33, 35-40 and 50-51 are requested.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 16, 17, 31 and 34 stand rejected under 35 U.S.C. § 112, second paragraph, as assertedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Claims 16, 17, 31 and 34 have been canceled rendering the rejections thereof moot.

Rejections under 35 U.S.C. § 102

Smith et al.

Claims 15-23 and 31-40 stand rejected under 35 U.S.C. § 102(a) as assertedly being anticipated by Smith et al. Applicants will forward the certified priority documents to the Office as soon as they are received. Thus, upon filing of the certified priority documents, the anticipation rejections in view of Smith et al. will become moot.

Charland et al.

Claims 15-23 and 31-40 stand rejected under 35 U.S.C. § 102(b) as assertedly being anticipated by Charland et al. Applicants respectfully traverse the rejections as hereinafter set forth.

As an initial matter, since the Charland et al. reference was published in 1998 and the present application claims priority to EP documents establishing a date of at least July 22, 1998, the Charland et al. rejection should not be a 102(b) rejection.

Charland et al. cannot anticipate amended independent claim 15 since Charland et al. does not disclose each and every element of amended claim 15. Amended claim 15 recites in part wherein the recombinant *Streptococcus suis* mutant is stable. Charland et al. does not disclose a stable *Streptococcus suis* mutant, but is limited to the production of transconjugants by

transposan mutagenesis. (*See*, Charland et al., page 326). Since the transconjugants of Charland et al. are not stable, Charland et al. does not anticipate amended claim 15.

As amended, independent claim 18 is directed to a vaccine comprising a *Streptococcus suis* mutant deficient in capsular expression, wherein the *Streptococcus suis* mutant is stable. Charland et al. does not disclose each and every element of claim 18 since the transconjugants of Charland et al. are not stable. (*See*, *Id.*).

Dependent claims 21-23, 32-33 and 35-40 are not anticipated, at the very least, as depending from novel independent claim 18.

With further regard to claim 32, it cannot be anticipated since Charland et al. does not disclose homologous recombination, but is limited to the use of transposan mutagenesis. (*See*, *Id.* at Abstract).

Accordingly, reconsideration and withdrawal of the anticipation rejection of claims 15, 18, 21-23, 32-33 and 35-40 are requested.

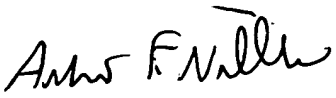
Yother et al.

Claims 16, 17, 31 and 34 stand rejected under 35 U.S.C. § 102(b) as assertedly being anticipated by Yother et al. Claims 16, 17, 31 and 34 have been canceled rendering the rejections thereof moot.

CONCLUSION

In view of the foregoing amendments and remarks, applicants submit that the claims define patentable subject matter. Should questions exist after consideration of the foregoing, the Office is kindly requested to contact the applicants' attorney at the address of telephone number below.

Respectfully submitted,



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Enclosures: Appendices A and B

Document in ProLaw